

REMARKS

Applicants respectfully request that the above-identified patent application be reexamined and reconsidered.

Claims 1-22 are now pending in this application. In an Office Action dated August 15, 2003 (hereinafter the "Office Action"), Claims 1-3, 9-13, 16-18, 21, and 22 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,457,065 to Rich et al. (hereinafter "Rich"). Claims 4-8, 14-15, 19, and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rich in view of U.S. Patent No. 6,108,664 to Nori et al. (hereinafter "Nori"). Claim 1 was objected to for having the terms "a" and "the" next to one another. In this response, applicants have amended the claims to address the claim objection. While applicants strongly believe that the previously presented claims were clearly allowable in view of the cited and applied references, in order to advance the prosecution of this application, a variety of language changes have been made in order to make the claim language more particularly point out and distinctly claim the subject matter that applicants regard as the invention. Among other things, antecedent and grammatical errors have been addressed and eliminated. Pursuant to 37 C.F.R. § 1.111 and for the reasons set forth below, applicants respectfully request reconsideration and allowance of this application.

Prior to discussing in detail why applicants believe that all of the claims in the application are allowable, a brief description of applicants' invention and the cited references is provided. The following discussion of the disclosed embodiments of applicants' invention and the teachings of the applied references are not provided to define the scope or interpretation of any of applicants' claims. Instead, such discussed differences are provided to help the U.S. Patent and Trademark Office (hereinafter "the Office") better appreciate important claim distinctions discussed thereafter.

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Summary of the Invention

The present invention provides a method and system for efficiently synchronizing multiple databases stored on a client computer and a server computer. Each database contains a plurality of objects, which include at least one parent object and at least one associated child object. The present invention utilizes the parent-child relationships between database objects to determine if certain child objects stored in the client computer should be communicated to the server computer. According to one embodiment, when the client database is synchronized with the server database, parent objects are first communicated from the client to the server. Next, child objects associated with parent objects are communicated if there are no communication errors in the transfer of the parent objects. The method does not communicate a child object if its associated parent object is not properly communicated.

In another embodiment of the database synchronization method, a server computer is used to generate object ID numbers for corresponding database objects stored on a client computer and the server computer. In this embodiment, the server computer receives a parent object from the client computer. The server computer then assigns a status code and a server ID to the parent object. If the parent object was properly communicated, the server computer assigns a status code indicating a successful upload of the parent object. The server computer then communicates the status code and the server ID to the client computer. The client computer then stores the received status code and server ID in all child objects associated with the parent object. The received server ID replaces any database ID of the child objects, if any, stored in the client computer's database. The client computer then communicates each child object having the status code and server ID to the server computer. Thus, if a parent object has been successfully uploaded to the server computer, its children, grandchildren, and other successors are also uploaded to the server computer. If any particular object is not successfully uploaded from the

client computer to the server computer, lower level objects, i.e., children, grandchildren, etc., of the particular object, are all bypassed in the synchronization process and not uploaded to the server computer. In addition to providing an efficient synchronization method, this embodiment allows the server and client to generate object IDs in duplicated databases without generating conflicting ID numbers for identical objects.

Summary of Rich

Rich purportedly discloses a processing system for improving the performance of distributed object systems. When a user of a workstation accesses an object stored in a global repository, the object is replicated to the user's workstation. Thereafter, modifications to the object occur locally at the workstation. When the user requests to commit the modifications, a determination is first made as to whether committing the modifications will result in an unacceptable data conflict. If no unacceptable data conflict will occur, and after resolution of those conflicts that can be resolved, the modifications are committed to the object stored in the global repository.

Rich refers to the workstation as a child node and the server computer storing the global repository a parent node. During operation, the method replicates objects from the parent node to the child node during a transaction between the two nodes. When the transaction is committed, i.e., data is written to the global repository, the method simply merges the replica of the object from the child node to the parent node. Rich does not disclose or suggest a method where the communication of a database object relies on a successful communication of another database object.

Summary of Nori

Nori purportedly discloses a system and method for presenting and modifying data from a set of tables in a database. Nori discloses general methods for defining views based on a set of

tables that include relational tables or object tables. The view defines a presentation of data from the one or more tables as a set of objects that reside in the database. Data is read from the rows of the tables based on the view, and is presented as a set of objects that reside in the database. An object ID that is based on data from the one or more rows is generated and associated with each object presented. *Nori*: Abstract. *Nori* also discloses a generally known method for assigning database IDs to objects when an object is created. *Id.* Col. 8, lines 53-60. *Nori* does not disclose or suggest a method related to a database synchronization process. Moreover, *Nori* does not disclose or suggest a method where the communication of a database objects relies on a successful communication of another database object.

Rejection of Claims 1-23 Under 35 U.S.C. § 102

The Office Action rejected Claims 1-3, 9-13, 16-18, 21, and 22 under 35 U.S.C. § 102(e) as being anticipated by Rich. The Office Action asserts that Rich discloses each and every element of these claims. As described in more detail below, applicants respectfully disagree.

With respect to Claim 1, as amended, applicants claim:

A method of optimizing the synchronization of data between a client computer having a client database and a server computer having a server database, comprising:

communicating a plurality of data objects from the client computer to the server computer, wherein the plurality of data objects includes a parent object;

determining if the parent object is improperly received, wherein the determination of an improperly received parent object is based upon the detection of a data transfer error associated with the parent object; and

selectively communicating a child object associated with the parent object from the client computer to the server computer, only if no data transfer error was detected with respect to the parent object.

As amended, Claim 1 defines a method where the communication of the child object depends on the result of the communication of the parent object. More specifically, the claimed method involves (1) communicating a "parent object," and (2) "selectively communicating a

child object associated with the parent object from the client computer to the server computer, only if no data transfer error was detected with respect to the parent object." As summarized above and described in several sections of applicants' specification, including the abstract, the present invention provides a synchronization method that reduces the data communicated between the client and server.

Conversely, Rich purportedly discloses a processing system for improving the performance of distributed object systems. In its description, Rich refers to a workstation as a child node and a server computer storing a global repository of objects a parent node. When a user of the child node, e.g., a workstation, accesses an object stored in a global repository of a parent node, the method replicates the object from the parent node to the child node. Thereafter, modifications to the object occur locally at the workstation. When the user requests to commit the modifications, a determination is first made as to whether committing the modifications will result in an unacceptable data conflict. If no unacceptable data conflict will occur, or after resolution of those conflicts that can be resolved, the modifications are committed.

Simply stated, the method disclosed in Rich merely determines if an object stored on a child node should be merged with an object stored on a parent node. The two objects are conditionally merged together based on a condition that depends on the existence of an unacceptable data conflict. Applicants respectfully submit that a method of merging two objects together is quite different than a method of (1) "communicating a plurality of data objects from the client computer to the server computer, wherein the plurality of data objects includes a parent object;" and (2) "selectively communicating a child object associated with the parent object from the client computer to the server computer, only if no data transfer error was detected with respect to the parent object." Thus, Rich does not disclose or suggest a method where the

communication of one object, such as a child object, depends on the communication of another object, such as a parent object.

Although Rich refers to "parent" and "child" nodes/transactions, Rich's use of these terms is not consistent with applicants' use of these terms. In Rich, data stored in a child node is merged into data stored in a parent node. On the other hand, applicants' claimed method involves the communication of a child object from a client to a server. The communication of the child object is separate from the communication of a parent object. More specifically, applicants' claimed method involves (1) communicating a parent object from a client computer to a server computer and (2) "selectively communicating a child object associated with the parent object from the client computer to the server computer. . . ." In the present invention,¹¹ data is not merged between the child and parent objects.¹¹ This distinction further indicates that the present invention involves methods and data structures that are different than those disclosed in Rich.

To establish a proper rejection under 35 U.S.C. § 102, M.P.E.P. § 2143 states that, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (August 2001). The M.P.E.P. further states that, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." *Id.* Applicants respectfully submit that Rich fails to expressly or inherently teach, disclose, or suggest each and every element of Claim 1. For instance, as explained above, Rich fails to disclose or suggest "communicating a plurality of data objects from the client computer to the server computer, wherein the plurality of data objects includes a parent object;" and "selectively communicating a child object associated with the parent object from the client computer to the server computer, only if no data transfer error was detected with respect to the parent object." Accordingly, for at least these reasons, applicants respectfully request that the rejection of Claim 1 be withdrawn.

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With respect to Claim 2, applicants claim a synchronization method where the communication of a child object depends on the communication of a parent object. More specifically, applicants claim:

A method of optimizing the synchronization of data between a client computer having a client database and a server computer having a server database, wherein each database comprises a plurality of data objects arranged in an object hierarchy comprising at least one parent object and at least one associated child object, comprising:

receiving at the server computer a parent object transferred from the client computer;

assigning a status code to the parent object received at the server computer, the status code being based upon the detection or non-detection of a data transfer error;

transmitting the status code assigned to the parent object to the client computer, wherein the status code is assigned to the parent object stored in the client database;

updating a status code of child objects associated with the parent object in the client database, the updated status code of child objects being based on the status code of the parent object; and

selectively communicating child objects associated with the parent object from the client computer to the server computer, wherein child objects associated with the parent object are communicated if the status code indicates a non-detection of a data transfer error associated with the parent object.

As amended, Claim 2 defines a method where the communication of child objects to the server depend on a status code that indicates a non-detection of a data transfer error of the parent object. In addition, Claim 2 also includes claim elements where the status codes assigned by the server are transmitted to the client computer and assigned to a "parent object stored in the client database." As summarized above, this synchronization method includes features that allow the server to generate object IDs for duplicated databases without generating conflicting ID numbers for identical objects.

As noted above, Rich does not disclose or suggest any method where the communication of one object, such as a child object, depends on the communication of another object, such as a

parent object. Moreover, among other features unique to applicants' invention, Rich does not disclose applicants' claimed combination of steps, including the combination of (1) "receiving at the server computer a parent object transferred from the client computer;" (2) "assigning a status code to the parent object received at the server computer, the status code being based upon the detection or non-detection of a data transfer error;" (3) "transmitting the status code assigned to the parent object to the client computer, wherein the status code is assigned to the parent object stored in the client database;" and (4) "selectively communicating child objects associated with the parent object from the client computer to the server computer, wherein child objects associated with the parent object are communicated if the status code indicates a non-detection of a data transfer error associated with the parent object."

Applicants respectfully submit that Rich also fails to discuss a method that allows a server to assign a "status code" to a "parent object received at the server" and "a parent object stored in the client database." Since Rich fails to expressly or inherently teach, disclose, or suggest each and every element of Claim 2, applicants respectfully request that the rejection of Claim 2 be withdrawn.

Since Claims 3, 9 and 10 depend from Claim 2, and Claims 11 and 12 are computer-readable medium and apparatus claims having language that parallels the language of Claim 2, the analysis applied to Claim 2 also applies to these claims and their respective dependent claims. Therefore, applicants respectfully submit that Claims 3 and 9-12 are in condition for allowance for the same reasons as Claim 2. In addition, applicants submit that the dependent claims are allowable for additional reasons.

Claim 4 defines a claimed combination of steps, including the combination of "assigning a server ID to the data object received at the server computer if no transfer error was detected; and transmitting the server ID assigned to the data object to the client computer." Applicants

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submit that the Office Action has failed to show, and applicants are unable to find, where Rich discloses a method where an ID is assigned "if no transfer error was detected." Rich discloses various methods of merging objects if "no unacceptable data conflict will occur." However, there is no suggestion of a method where server IDs are assigned if no transfer error is detected.

With respect to Claim 13, applicants claim a synchronization method where the communication of a child object depends on the communication of a parent object. In this method, a parent object is transmitted from a client computer to a server computer. The method also includes "selectively communicating child objects associated with the parent object from the client computer to the server computer, wherein child objects associated with the parent object are communicated if the status code indicates a non-detection of a data transfer error associated with the parent object."

As noted above, Rich does not disclose or suggest any method where the communication of one object, such as a child object, depends on the communication of another object, such as a parent object. Moreover, Rich fails to disclose a method of "selectively communicating child objects associated with the parent object from the client computer to the server computer, wherein child objects associated with the parent object are communicated if the status code indicates a non-detection of a data transfer error associated with the parent object." Among other features unique to applicants' invention, Rich does not disclose applicants' claimed combination of steps utilizing mapping information. Mapping information is simply absent from this cited reference. Thus, for at least these reasons, applicants respectfully request that the rejection of Claim 13, and dependent Claims 17 and 18, be withdrawn.

Claim 18 is directed to a synchronization method where the communication of a child object depends on the communication of a parent object. In this method, a parent object is received at a server computer. The method also includes "assigning a status code to the parent

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object, the status code being based upon the detection or non-detection of a data transfer error associated with the parent object" and "transmitting the status code assigned to the parent object from the server computer to the client computer, wherein the status code enables the client computer to selectively communicate at least one child object associated with the parent object if the status code assigned to the parent object indicates the absence of a data transfer error; and receiving at the server computer at least one child object associated with the parent object, if the status code assigned to the parent object indicates the absence of a data transfer error."

As noted above, Rich does not disclose or suggest any method where the communication of one object, such as a child object, depends on the communication of another object, such as a parent object. Accordingly, applicants submit that Rich does not disclose a method that includes "receiving at the server computer at least one child object associated with the parent object, if the status code assigned to the parent object indicates the absence of a data transfer error." Since Rich does not show "[t]he identical invention" "shown in as complete detail as is contained in the . . . claim," the rejection of Claim 18 fails to meet the requirements for a proper rejection under Section 102. Thus, for at least these reasons, applicants request that Claim 18, and its respective computer-readable medium and apparatus claims, Claims 21 and 22, are in condition for allowance.

Rejection of Claims 1-23 Under 35 U.S.C. § 103(a)

The Office Action rejected Claims 4-8, 14-15, 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Rich in view of Nori. The Office Action asserts that Rich and Nori suggest each and every element of these claims and that it would be obvious to combine the teachings of Rich and Nori. Applicants respectfully disagree.

As noted in detail above, the independent claims from which Claims 4-8, 14-15, 19, and 20, respectively, depend (Claims 2, 13 and 18) are all directed to methods where the

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communication of one object, such as a child object, depends on the communication of another object, such as a parent object. As described below, applicants respectfully submit that Rich, alone or in combination with Nori, fails to disclose or suggest this claimed feature.

Nori purportedly discloses a system and method for presenting and modifying data from a set of tables in a database. Nori discloses a general method for defining views based on a set of tables that include relational tables or object tables. Nori also discloses a generally known method for assigning database IDs to objects when an object is created. *Id.* Col. 8, lines 53-60. There is no suggestion of a database synchronization method. In addition, Nori does not make any reference to combining its disclosed methods with a synchronization method that involves a database having a hierarchy of parent and child objects.

With respect to Claims 4-8, referring to Claim 2, applicants submit that Rich, alone or in combination with Nori, fails to disclose or suggest applicants' claimed combination of steps, including the combination of (1) "receiving at the server computer a parent object transferred from the client computer;" (2) "assigning a status code to the parent object received at the server computer, the status code being based upon the detection or non-detection of a data transfer error;" (3) "transmitting the status code assigned to the parent object to the client computer, wherein the status code is assigned to the parent object stored in the client database;" and (4) "selectively communicating child objects associated with the parent object from the client computer to the server computer, wherein child objects associated with the parent object are communicated if the status code indicates a non-detection of a data transfer error associated with the parent object."

Although Nori refers to database IDs assigned by the server, the combination of Nori and Rich does not suggest a method including "assigning a status code to the parent object received at the server computer, the status code being based upon the detection or non-detection of a data

transfer error" and "transmitting the status code assigned to the parent object to the client computer, wherein the status code is assigned to the parent object stored in the client database."

In addition, specific to Claim 4, Rich and Nori fail to disclose or suggest other claim elements. Although Nori discloses a method of assigning an ID to a newly created database object, Nori does not suggest or contemplate a method of "assigning a server ID to the data object received at the server computer if no transfer error was detected; and transmitting the server ID assigned to the data object to the client computer." In view of the foregoing, by virtue of their dependency of Claim 2, applicants submit that Claims 4-8 are in condition for allowance.

With respect to Claims 14 and 15, applicants respectfully submit that Rich, alone or in combination with Nori, fails to disclose or suggest the claimed combination, including the Claim 13 recitation of "selectively transmitting child objects from the client computer to the server computer, wherein child objects associated with the parent object are communicated if the mapping information indicates a non-detection of a data transfer error associated with the parent object." In addition, Rich and Nori are silent with respect to the use of mapping information to indicate a non-detection of a data transfer error of the parent object. Since Rich, alone or in combination with Nori, fail to disclose these features, applicants submit that Claims 14 and 15 are in condition for allowance.

With respect to Claims 19 and 20, applicants respectfully submit that Rich, alone or in combination with Nori, fails to disclose or suggest the claimed combination, including the independent Claim 18, recitations of "assigning a status code to the parent object, the status code being based upon the detection or non-detection of a data transfer error associated with the parent object" and "transmitting the status code assigned to the parent object from the server computer to the client computer, wherein the status code enables the client computer to selectively communicate at least one child object associated with the parent object if the status

code assigned to the parent object indicates the absence of a data transfer error; and receiving at the server computer at least one child object associated with the parent object, if the status code assigned to the parent object indicates the absence of a data transfer error."

Even when combined with Nori, Rich does not disclose or suggest any method where the communication of one object, such as a child object, depends on the communication of another object, such as a parent object. Hence, it is clear that Rich and Nori fail to suggest each claim element of Claims 19 and 20. To establish a *prima facie* case of obviousness, M.P.E.P. § 2143 requires that the prior art references "*must* teach or suggest all of the claim limitations," and that there "must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings." M.P.E.P. § 2143 (August 2001) (emphasis added). As described above, the Office has failed to show, and applicants are unable to find, where Rich and Nori, alone or in combination, disclose or suggest each and every element of Claims 4-8, 14-15, 19 and 20. Thus, for at least these reasons, applicants respectfully submit that the Office has not established a *prima facie* case of obviousness and respectfully submit that these claims are in condition for allowance.

Objection to Claim 1

Applicants have amended Claim 1 to remove the word "a" which immediately followed the word "the." Applicants submit that Claim 1 is now in proper form, and request that the objection of this claim be withdrawn.

CONCLUSION


In view of the foregoing remarks, it is submitted that the present application is now in condition for allowance. Reconsideration and reexamination of the application, and allowance of

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the claims are solicited. If the Examiner has any questions or comments concerning this matter, the Examiner is invited to contact applicants' undersigned attorney at the number below.

Respectfully submitted,

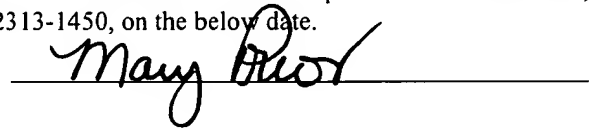
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Date: November 4, 2003



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